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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

*** Froeschle et al.

Art Unit : 3748

Serial No.: 10/810,538

Examiner: Ching Chang

Filed

: March 26, 2004

Title

: ELECTROMAGNETIC ACTUATOR AND CONTROL

Mail Stop Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

AMENDMENT A IN RESPONSE TO OFFICE ACTION DATED OCTOBER 28, 2004

Dear Commissioner:

Responsive to the office action mailed October 28, 2004, please amend the above-identified application in accordance with the following pages.

CERTIFICATE OF MAILING OR TRANSMISSION

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Applicant: Thomas A. Froeschle et al.

Attorney's Docket No.: 02103-212001

Serial No.: 10/810,538 Filed: March 26, 2004

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DESCRIPTION

Page 14, line 8, please substitute the following amended paragraphs:

The magnets <u>68a-68c</u> <u>66a-66e</u> of the armature assembly 64 are configured such that adjacent magnets have opposite radial magnetization. In other words, the uppermost and lowermost magnets, i.e <u>68a-68c</u> <u>66a-66e</u>, have a first radial polarization (e.g., north-south) whereas the magnet located in the middle of the armature assembly, i.e., magnet <u>68b</u> <u>66b</u>, has an opposite radial polarization (e.g., south-north). In this implementation, the actuator 60 uses an overhung design in which the axial height of the magnets, <u>68a-68c</u> <u>66a-66e</u>, is larger than the axial height of the corresponding coils, 64a-64c.

Referring to FIG. 4B, the stator assembly 62, in addition to including the three coils <u>64a-64c</u> 66a 66e, also includes a center pole 70 and a series of interlocking back iron members 72. The center pole 70 is formed of a material having high magnetic permeability (e.g., SMC) and functions as a magnetic return path for the magnetic field generated by the coils.

Page 15, line 4, please substitute the following amended paragraph:

As shown in FIGS. 4E-4F, the armature assembly 64 includes two spacers 82a-82b disposed between the three radially magnetized magnets <u>68a-68c</u> 66a-66e. The armature assembly also includes a ball joint assembly 86 that mechanically connects a valve stem 88 to the remainder of the armature assembly. A series of screws disposed in holes 89a-89d secures the ball joint assembly 86 to a coupler 90. One or more clips, e.g., clip 92, mechanically secures the magnets <u>68a-68c</u> 66a 66e and spacers 82a-82b to the coupler 90. The magnets <u>68a-68c</u> 66a 66e and spacers 82a-82b are split 83a, 83b in their axial direction to interrupt the dominant eddy current path.